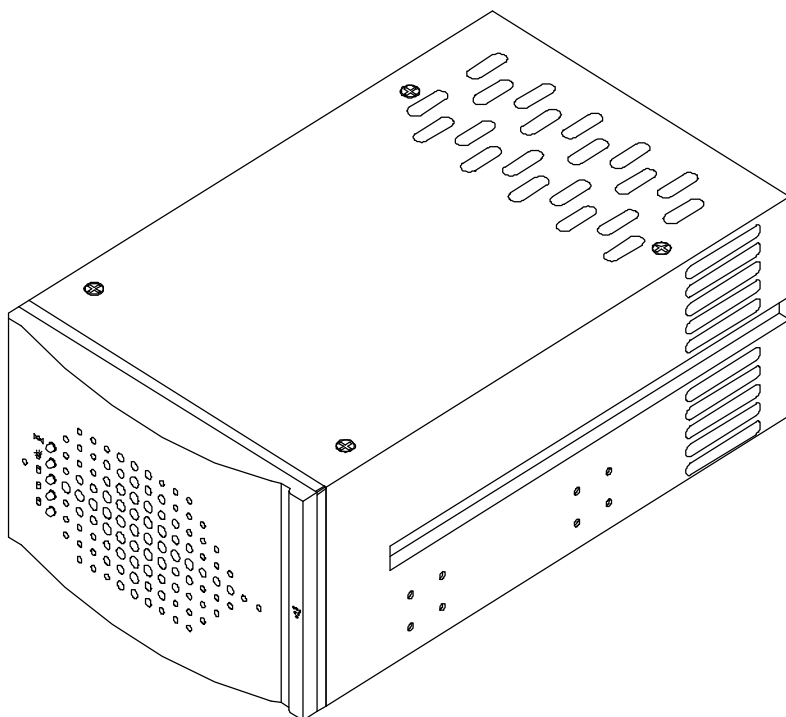


easyRAID[®] M2B

User's Manual



Version: **2.0**

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Chapter 1 Introduction

easyRAID M2B (ER-M2B) provides disk mirror function for the internal RAID Level 1 for small offices or home offices. easyRAID M2B is an excellent low-cost, high-efficiency substitute for expensive RAID Level 5 and low-efficiency magnetic tape as a back up.

1-1 Functions and Features

- The two hard disks can simultaneously perform mirroring with synchronization.
- One of the two hard disks can function as source, and the other as target for back up purpose.
- Providing **on-line rebuild** function.
- **Hot plug** to replace damaged HDD without interrupting system.
- ATA-133 E-IDE interface, up to 133 MB/s
- Alarm for HDD failure.
- System maintains normal performance when any HDD is damaged.
- Supports most PC **Operating Systems (OS)**, no drivers required.
- Compatible with most HDD.
- LCD screen showing HDD operating status.
- Status Indicator for HDD "reading" or "writing" modes.
- High power fan to prevent overheating.
- High quality stainless handle (SUS 302) for Removable Carrier.

1-2 Product Specifications

• System Specifications	Host Interface	ATA-133 / UDMA 133
	Processor	8032 Microprozessor
	RAID level	1
	Installation Space	5¼" FH Expansion Bay
	Drive	2x ATA -133 / UDMA 133 E-IDE, 1" Height
	HDD Selection Mode	Master/Slave
	"Big Drive" Support	Yes
	Overheating prevention	6cm Ball Bearing Fan
	Operating Temperature	0 ⁰ ~55 ⁰ C
	Non operating Temperature	-20 ⁰ ~70 ⁰ C
• Environmental Conditions		
• Power	Input Voltage (DC)	+5V, +12V
• Reliability	MTBF	>250,000 Hours
• Dimensions	Measures (mm)	146(W) x 238(D) x 85(H)
	Weight	1.5 Kg(HDD excluded)
• Safety	CE Certificate	

1-3 System Requirements and support

- Hardware Requirements
 1. Computer System with IDE Interface
 2. HDD with standard EIDE/IDE Interface.
 3. 2 x 5¼" Expansion Bay.
 4. One 4-pin DC power socket outlet.

1-4 Note (Read carefully before using ER-M2B)

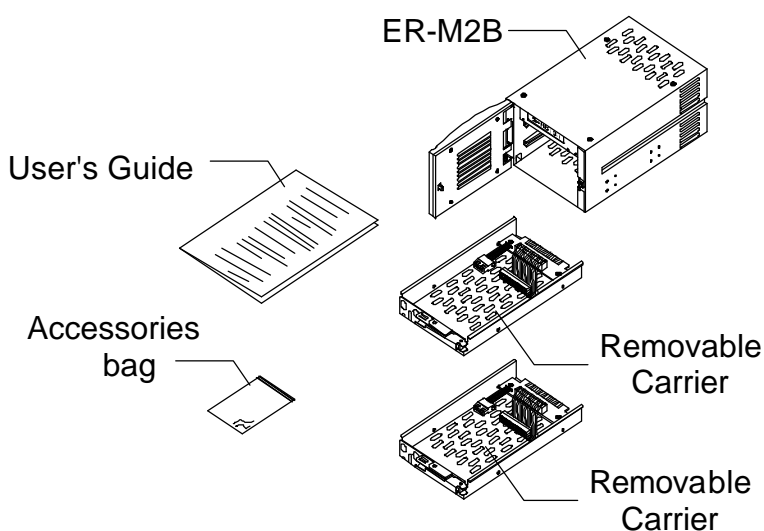
1. Use two identical hard disks (same brand name and model) for optimum performance and greatest convenience.
2. To obtain optimum performance, use two brand new hard disks or hard disks in perfect conditions without any damaged sectors.
3. Use hard disks with a minimum capacity of 3.2GB Ultra DMA 33/66.
4. Easy to use with hard disks manufactured by QUANTUM, IBM/HITACHI, MAXTOR, or Western Digital.
5. Whether it is the upper or lower deck, please set up both Hard Disks in ER-M2B to **MASTER** mode. (Drive Mode: HDD Factory Default), or else HDD won't be detected.
6. If replacing an old HDD with a new one, please purchase the same brand and choose a disk capacity greater than or equal to the original one.
7. ER-M2B will automatically format a new HDD. No need to use FDISK or FORMAT. Use the **Auto-Rebuild** Function to copy data to the new target HDD.
8. Normal HDD mode for ER-M2B is Ultra DMA. In the event of failure to work with EIDE connector, HDD will automatically configure itself in PIO mode 4 or with lower speed.
9. There is a 6mm Ball Bearing Fan integrated in the ER-M2B to prevent overheating for 7200rpm HDD. When two 7200rpm Hard Disks are installed in a very busy server, we suggest adopting a PC case with optimal design for overheating prevention in order to avoid PC or RAID crashes.
10. In case of power failure during the **Auto-Rebuild** Function, controller will remember the rebuilding progress percentage and carry on the operations when the power is restored.

Chapter 2 Installation

2-1 Package Contents

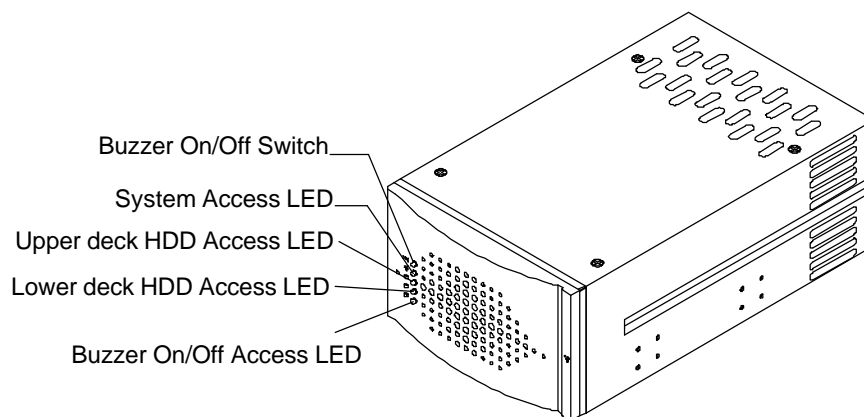
Your easyRAID M2B package includes the following: please contact our distributors in case of any missing or damaged items.

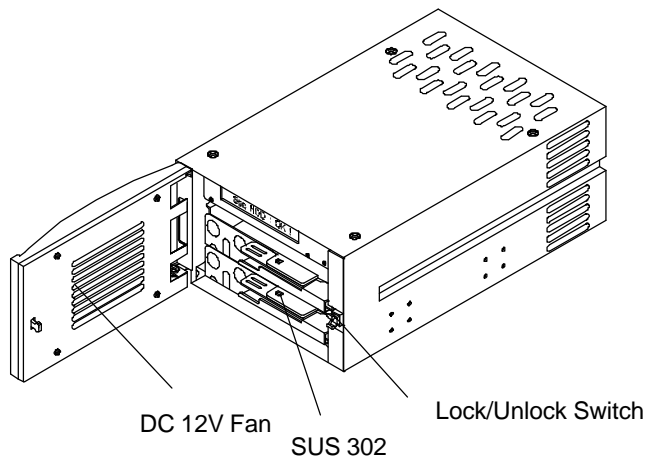
Item	Quantity
ER-M2B	1
Removable Carrier	2
User's Guide	1
Accessories bag	1 (including 8 x 6#-32 screw and 8 x M3×6 screw)



2-2 Part Description

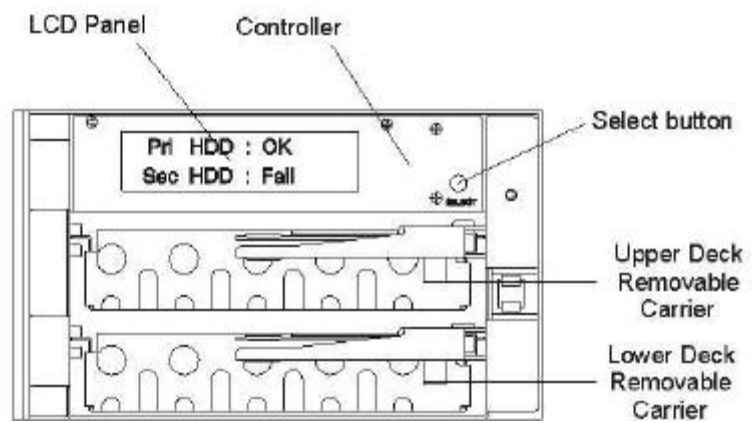
- Front Panel



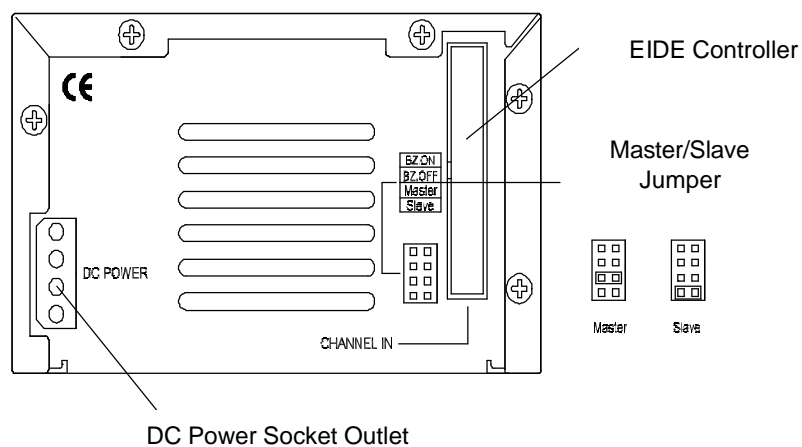


Buzzer On/Off switch: Alarm functions when buzzer switch is on. To release the function, please push the button. Push the button again to recover the function. LED displays **Red** when buzzer switch is **Off**.

Inside the ER-M2B



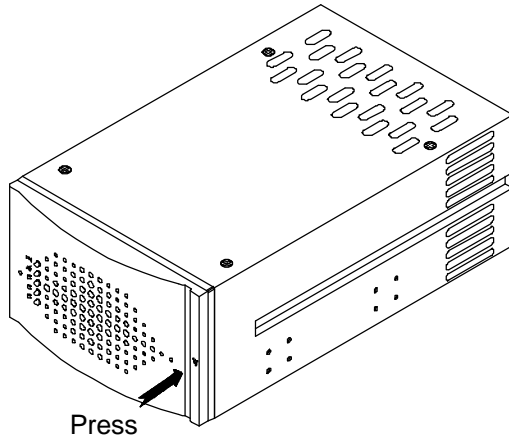
• Back Panel



2-3 How to open/close the front panel

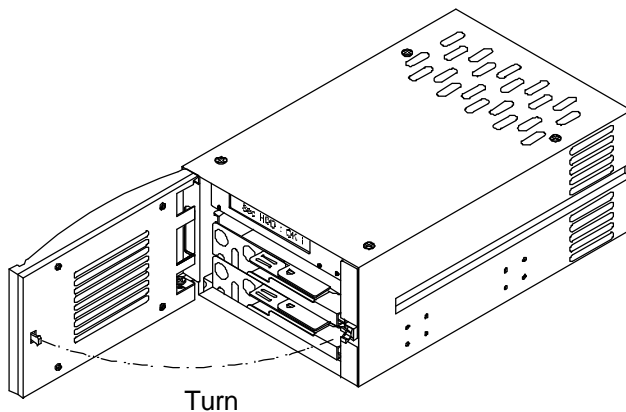
- Opening the front panel

1. Touch the right side center of the front panel with your finger as indicated by the arrow. There is a trigger to open the panel.



- Closing the front panel

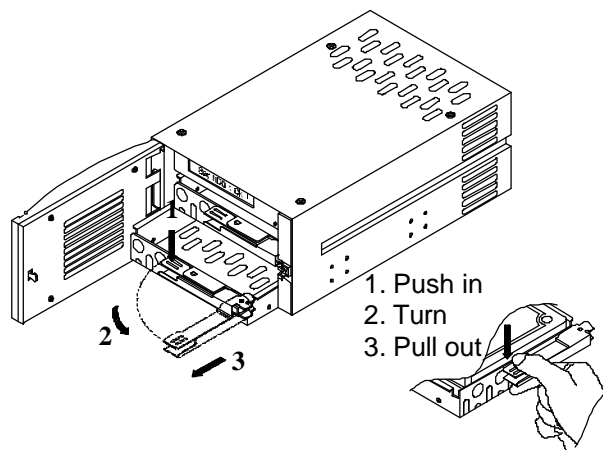
1. Turn the panel in the direction indicated by the arrow to connect it with the trigger until it clicks inside, which means the front panel is closed.



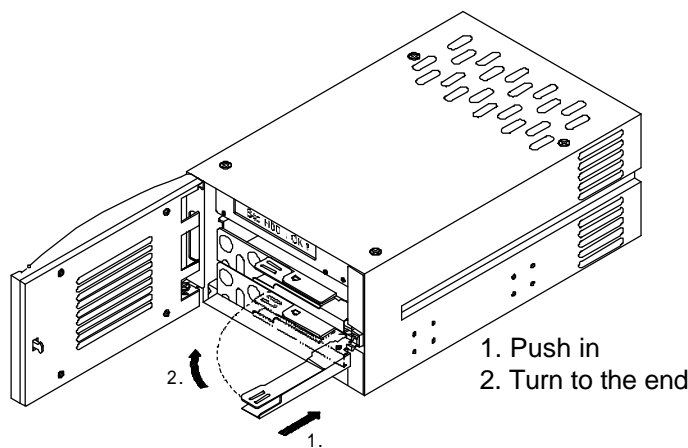
2-4 How to remove/insert the Removable Carrier

- Removing the Removable Carrier

1. Following the indicated direction, press down and hold the Removable Carrier Handle to unlock the spring from its button.
2. Turn the Removable Carrier Handle in the direction indicated by the arrow to remove the Removable Carrier.
3. Pull out the Removable Carrier along the direction shown in the figure.

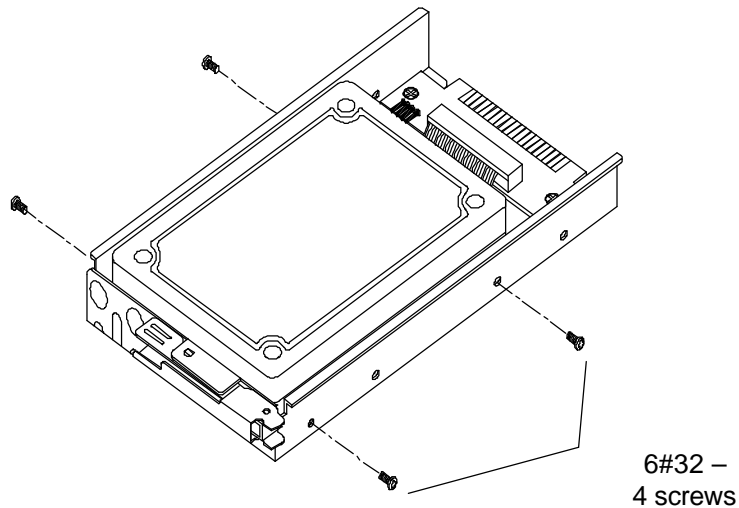


- To insert the Removable Carrier
 1. Following the direction indicated by the arrow, slide the Removable Carrier along the rail into the slot end of the upper or lower deck.
 2. Following the direction indicated by the arrow, turn the Removable Carrier Handle to the end in order to fix it with the spring.



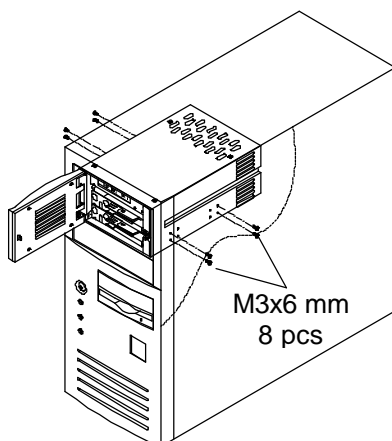
2-5 Installing HDD in the Removable Carrier

- Set Master/Slave jumpers to **MASTER** (factory default).
- Connect the power cord and the Removable Carrier's EIDE/IDE interface cable to the HDD.
- Inset the HDD into the Removable Carrier.
- Fasten the HDD with the attached 6#-32 screws in their four locations. Place the power cord and the EIDE/IDE interface cable lower than the surface of the HDD in order to avoid any hindrance when taking out the HDD. Please refer to the following illustration.



2-6 Installing the ER-M2B in your Computer

- Turn the power off.
- Make sure there are two 5¼" Expansion bays available for the ER-M2B.
- Set up MASTER or SLAVE positions of ER-M2B according to your needs. (Factory default: **Master**). If you need to set it to SLAVE, please modify the jumpers on the back panel of the ER-M2B.
- Remove computer case and insert the ER-M2B into the Expansion bay.
- Connect power cord and EIDE/IDE interface cable to the right connector.
- Fasten ER-M2B at four places with attached M3×6mm screws, according to the following illustration.
- Replace and fasten computer case.



Chapter 3 RAID Use

- After proper installation, the ER-M2B can be considered as one HDD.
- Both FDISK and FORMAT commands have the same function on the two Hard Disks inside the ER-M2B.
- Some OS can perform self partitioning and formatting without going through the above mentioned process.
- After turning PC power on, ER-M2B's two hard disks maintain synchronized operation unless one of them stops working.

3-1 Factory Default

- Buzzer On/Off switch ON
- MASTER/SLAVE JUMPER MASTER

3-2 Installation

- **Installing two new Hard Disks**
 1. Push the switch on the right side center of the ER-M2B to open its front panel. (Refer to Section 2-3 How to open/close the front panel)
 2. Insert two Removable Carriers into the ER-M2B. (HDD assembled) (Refer to Section 2-4 How to remove/insert the Removable Carrier.)
 3. For handling convenience, open the panel as wide as possible. Set Operation Mode Switch to NORMAL on the upper right corner of controller.
 4. Turn the power on. In the BIOS setting screen, change HDD type to AUTO. This will enable the computer system to automatically detect the type and model of your Hard Disks.
 5. After restarting the computer, the ER-M2B will automatically format HDD synchronously. In addition, it will install the OS and other required software. (Refer to OS Installation Guide)
 6. When the two installed hard disks have different capacities, ER-M2B will auto detect and set the capacity according to the smaller one. This way your Computer will suppose that the ER-M2B has a smaller capacity.

- **Installing one new HDD in Auto-Rebuild mode**

1. Locate the original HDD in either the upper or lower deck of ER-M2B.
2. In the event of no HDD inside, ER-M2B's buzzer begins to sound after computer is started. To switch off the alarm, use a sharp pointed object to turn off the buzzer on the front panel. The Access LED on the lower part of the panel will be on. (Note 1)
3. After loading the OS, insert the Removable Carrier with the new HDD into the upper or lower deck of the ER-M2B. The capacity of the new HDD should be equal to or greater than the original one.
4. Wait a few minutes, after which the ER-M2B will automatically perform the **Auto-Rebuild** function. (Refer to Chapter 4 Automatic Rebuild Function).
5. After the **Auto-Rebuild**, use a sharp pointed object to turn on the buzzer on the front panel. The Access LED on the lower part of the panel will be off. (Note 2)

- **Hot plug and data on-line rebuild**

1. In the event of any installed HDD's operation failure, the ER-M2B buzzer will sound. Pull out the Removable Carrier together with the damaged HDD without turning the power off.
2. PC will continue normally to store data into the other HDD; no data loss will happen.
3. First follow the reverse order of the steps described in Section 2-5 Installing HDD in Removable Carrier to remove the damaged HDD, and then replace it with a new HDD.
4. Insert the Removable Carrier with the new HDD into the ER-M2B.
5. Wait a moment. The ER-M2B will automatically perform rebuild function on the new HDD. (Refer to Chapter 4 Automatic Rebuild Function)
6. Use a sharp pointed object to turn on the buzzer on the front panel. The Access LED on the lower part of the panel will be off. (Refer to Note 2).
7. After the rebuild process is over, any data on the newly installed HDD will be overwritten.

Note1: Alarm functions when buzzer switch is "On".

Note2: Buzzer access LED displays red when buzzer switch is "Off".

Chapter 4 Automatic Rebuild Function

- Automatic Rebuild Function (A.R.F.) supports Windows NT4.0 Server & Workstation, Windows 98*/95*/3.1X, Dos 6.22, SCO UNIX System V, Linux (RedHat, Slackware, Debian, S.u.S.E., OPEN, Turbo), Novell NetWare** V3.12, V4.1X, V5.X.
- In most OS, the A.R.F. is performed in the background in order to restore rapidly a HDD to its normal read/write operation.
- When the A.R.F. runs under Windows 95/98 during active DMA, if mouse operation or foreground response should slow down, please close the DMA and start the A.R.F. once again.
- Please choose optimal hardware and ER-M2B compatible OS.
- The HDD on the upper deck is designated as the **Primary**, the one on the lower deck as the **Secondary**.

4-1 Installing an extra HDD for rebuilding

- While the HDD with data is on the upper deck of the ER-M2B, start the computer. The computer will automatically detect the HDD on the lower deck of the ER-M2B. In case of abnormal operation, the buzzer will sound and the LCD will show the following:

Pri HDD:	OK
Sec HDD:	Fail

1. Insert a new HDD correctly on the lower deck of the ER-M2B. Screen will display and buzzer will sound in case of abnormal operation. If the HDD is properly set up, the LCD will show the following:

Pri HDD:	OK
Sec HDD:	OK

2. A few seconds later, the LCD will show:

```
Rebuilding ...  
Pri      Sec XXX%
```

The data in the upper deck's HDD will be rebuilt in the lower deck's HDD.

XXX%: Percentage completed, ranging from 0~100.

3. When the rebuild is completed, LCD will show:

```
Pri HDD:    OK  
Sec HDD:    OK
```

- While data is in the HDD on the upper deck of the ER-M2B, start up the computer. The computer system will automatically check the status of the HDD on the upper deck of the ER-M2B. In case of failure, the buzzer will sound and the LCD will show the following:

```
Pri HDD: Fail  
Sec HDD:  OK
```

1. Set up a new HDD on the lower deck of the ER-M2B. If the HDD is properly set up, the LCD will show the following:

```
Pri HDD:    OK  
Sec HDD:    OK
```

2. A few seconds later, the LCD will show:

```
Rebuilding ...  
Sec      Pri XXX%
```

The data in the lower deck's HDD will be rebuilt in the upper deck's HDD.

XXX%: Percentage completed, ranging from 0~100.

3. When the rebuild function is completed, the LCD will show:

```
Pri HDD:    OK  
Sec HDD:    OK
```

4-2 LCD display showing HDD status

- Disk on the upper deck (Primary Disk): Fail
Disk on the lower deck (Secondary Disk): OK

```
Pri HDD: Fail
Sec HDD: OK
```

- Disk on the upper deck (Primary Disk): OK
Disk on the lower deck (Secondary Disk): Fail

```
Pri HDD: OK
Sec HDD: Fail
```

- Disk on the upper deck (Primary Disk): Fail
Disk on the lower deck (Secondary Disk): Fail

```
Pri HDD: Fail
Sec HDD: Fail
```

- Disk on the upper deck (Primary Disk): OK
Disk on the lower deck (Secondary Disk): OK

```
Pri HDD: OK
Sec HDD: OK
```

- Primary Disk capacity > Secondary Disk capacity

```
Wrong Capacity
PRI > SEC
```

- Secondary Disk capacity > Primary Disk capacity

```
Wrong Capacity
SEC > PRI
```

- When the LCD shows Rebuilding Flag Error:

1. Close the computer

```
Rebuild Flag ERR  
Pri: S      SEC: S
```

2. Fold on the Select button

3. Open the Computer

4. When the LCD shows Clear Rebuilding Yes/No, select Yes

```
Clear Rebuilding  
Yes / No
```

5. After selecting Yes, the LCD will show the following:

```
Pri HDD: OK  
Sec HDD: OK
```

6. Please reboot the computer

Chapter 5 Questions & Answers

Q1: Why is the computer system unable to reboot or re-configure after ER-M2B is installed?

- A:1.** ER-M2B supports IDE I/O interface. However, it is not compatible with motherboards building the ITE IT8680F-A chip. Replace it with another I/O chip compatible with the ER-M2B.
2. Check if IDE bus connector is connected properly.
 3. Check if Operation Mode Switch is set to NORMAL position on the control panel for copy mode.

Q2: What happens if power is shut down while the ER-M2B is running?

- A:1.** In case of power failure during the **Auto-Rebuild** Function, controller will remember the rebuilding progress percentage and carry on the operations when the power is restored.
2. In case of power failure during **BACK UP**, copied data will be incomplete and you will have to restart **BACK UP** when power is restored.

Q3: What is the configuration for ER-M2B (with 1 or 2 hard disks) when one HDD is already installed?

- A:1.** On the same IDE buses, set the jumper for ER-M2B to MASTER and the original disk to SLAVE. Otherwise, the original HDD cannot be detected.
2. On different IDE buses, set MASTER or SLAVE for ER-M2B and original HDD respectively.

Q4: When using the ER-M2B, the computer system is unable to read/write properly.

- A:1.** Check if IDE bus connector is inserted properly.
2. Check if IDE bus length is 46cm or 18".
(Compliant to ATA 4 specification.)

Q5: The buzzer alarm keeps sounding during ER-M2B operation.

- A:** Check if both Removable Carriers (hard disks installed) on the upper and lower decks are inserted into the right position. Please refer to section 2-5 Installing HDD in Removable Carrier and section 2-4 Remove/insert Removable Carrier.

Q6: How to turn on/off the buzzer?

A:1. The factory default of the buzzer on/off switch is ON.

2. Use a sharp pointed object to turn off buzzer alarm on the front panel (Refer to Section 2-2 Part Description)
3. Use a sharp pointed object to turn on buzzer alarm on the front panel.

Q7: Why do the responses of the computer system slow down when ER-M2B is under rebuilding?

A:1. The performance of computer system is related to CPU, motherboard design and peripherals. ER-M2B can slow down PC performance.

Q8: Is it possible to lose data or disable performance when performing BACK UP in the ER-M2B?

- A:**1. To avoid data loss from overwriting on source disk, make sure the source disk is on the upper deck, target disk on the lower deck.
2. The capacity of the target disk must be larger than the source disk.

Q9: How is the HDD capacity configured when replacing with a new disk?

- A:** 1. ER-M2B is configured to the least capacity detected when ER-M2B is installed for the first time.
2. When larger capacity is replaced in ER-M2B, the HDD capacity of ER-M2B remains unchanged.

APPENDIX

1. Although the ER-M2B is structured to be compatible with other HDD main brands, we will not be responsible for any data loss resulting in any damages or defects.
2. The brand names and products used in this manual are trademarks, registered trademarks, trade names of their respective holders.
3. Specification and feature is subject to change with out notice.